CHAPTER 5

ENGINEERING

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provided on RA Plate 5-1 of this submittal. The initial segment of the refuse pile was constructed in a gravel pit. The first four (4) feet of refuse material was used to fill a pit and bring it to grade. The remainder of the refuse material will be placed above grade and reach a total pile height of sixty (60) feet above portions of the immediate surrounding area as provided on RA Plate 5-1 of this submittal. As shown on RA Plate 1-1, the hills surrounding the site range in elevation from 5887 to 6283, therefore the reclaimed elevation of the refuse pile of 5980 to 6000 will blend with the surrounding area.

Surface Facilities. The surface facilities associated with the refuse pile site include: the refuse pile, temporary material/snow storage areas, soil stockpiles, access road, sedimentation pond, and drainage control structures. Facilities are shown or mentioned on RA Plate 5-1. Detailed information on sedimentation pond and drainage facilities is presented in Chapter 7 of this submittal. Cross sections of the refuse storage pile(s) are provided on RA Plate 5-1.

Transportation Facilities. A permanent road is not anticipated to be constructed, used, or maintained by CFC in the storage area. During construction of the pile, temporary access roads will be constructed and maintained. The temporary roads will be reclaimed and seeded with the permanent reclamation seed mix (Section 341.200 of this amendment). Refer to RA Attachment 5-6 for drawings of the paved access road.

521.200 Signs and Markers

Mine and Permit Identification Signs. A mine and permit identification sign will be displayed at the refuse pile site. This sign will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area. The sign will contain the following information:

Mine name,
Company name,
Company address and telephone number,
MSHA identification number, and
Permanent program permit identification number as obtained from the Division.

Perimeter Markers. The perimeter of all areas affected by surface operations were clearly marked before beginning mining activities. The markers will be a design that can be easily seen and will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

Buffer Zone Markers. Stream buffer zone markers are not required for this area.

Topsoil Markers. Markers will be placed on all soil stockpiles. These markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

522 Coal Recovery

No coal recovery will be performed at this site.

523 Mining Methods

No mining will be performed at this site.

524 Blasting and Explosives

No explosives are to be used at this site.

525 Subsidence

No subsidence will occur in this area, because no underground coal mining will occur beneath the refuse pile site. Therefore, there will be no effects on the site from coal mining related subsidence.

526 Mine Facilities

526.100 Mine Structures and Facilities

No buildings exist or are proposed at the refuse pile site; therefore, no existing buildings will be used

in connection with or to facilitate this proposed coal mining and reclamation operation.

526.200 Utility Installation and Support Facilities

No utilities are to be installed at this site.

527 Transportation Facilities

527.100 Road Classification

No permanent roads are to be built in association with the construction of the refuse pile. A temporary road will be used to access the site. The access road to the refuse pile and the temporary road to construct the refuse pile are classified as primary roads. Refer to Section 521.100 of this amendment for additional detail.

The existing road to access the site from the Dugout Canyon Road will be paved to provide all weather access to the site. The road will have a guard rail constructed to comply with engineering, UDOT and MSHA requirements. Refer to RA Attachment 5-6 for drawings of the road.

527.200 Description of Transportation Facilities

The access road to the refuse pile site follows the alignment of an existing road shown on RA Plate 7-1. The access road is approximately 840 feet long and will have paved surface approximately 20 feet wide. The access road will have a maximum grade of 16% and an average grade of 10%. The road will gently slope towards UD-1c which drains to culvert UC-1 (See cross-section RA Figure 5-1 2). The road does not cross any natural drainage. Culvert, UC-1, was installed at the intersection of the access road and the county road, to allow free flow of the runoff in the county road borrow ditch. Specific design information for the culvert is provided in RA Attachment 7-4.

The temporary access road is shown on RA Plate 5-1. The road is approximately 20 feet wide and is constructed on compacted subsoil. The road will have an uniform grade of 2% within the site (See cross-section RA Figure 5-2). The runoff from the road will flow into drainage ditches and then into the sediment pond.

During operations, the access road and temporary access road will be maintained using a road grader and any other equipment which may be necessary to ensure compliance. Drainage ditches will be maintained to ensure proper functioning.

Accidental spillage of coal mine waste during haulage from the mine site to the refuse pile will be minimized by not overloading the haulage trucks. Accidental spills, if they occur, will be cleaned up and transported to the refuse site, in a timely manner.

If a catastrophic events causes damage to access roads, the rapid repair of the road/roads will begin as soon as practical following the catastrophic damage.

528 Handling and Disposal of Coal, Excess Spoil, and Coal Mine Waste

Coal mine waste and/or underground development waste materials generated at the Dugout Mine, will be transported to the refuse site and disposed of in a controlled manner in accordance with Section 536. Construction of the refuse pile will meet MSHA and DOGM requirements in accordance with the approved plan.

Non-coal and hazardous wastes will not be disposed of in the refuse pile. They will be handled in accordance with the approved M&RP.

529 Management of Mine Openings

No mine openings will be built in the area.

530 OPERATIONAL DESIGN CRITERIA AND PLANS

531 General

This section contains the general plans for the construction of the sediment control measures and general construction and maintenance of the refuse pile area. This site will be used by CFC to

handle coal mine waste or underground development waste that may be generated by the Dugout Mine. Also, a portion of the site will be used as a temporary storage yard for mine materials and a place for disposal of excess snow from the Dugout Mine site.

During operations, the runoff from the site area will be treated through the use of sediment controls such as diversion ditches and berms, a sediment pond, and silt fences and/or straw bales. These structures will be constructed, to handle the site runoff, before the initial refuse is placed.

532 Sediment Control

Sediment-control measures for the site area are described in detail in Sections 732 and 742 of this submittal. Runoff-control structures at the refuse pile area have been designed to convey runoff in a non-erosive manner. Sediment yields in the permit area are minimized by, disturbing the smallest practicable area during the construction or modification of surface facilities and contemporaneously reclaiming areas suitable for such reclamation.

533 Impoundments

533.100 Slope Stability

The only impoundment with an embankment that will be constructed, used, or maintained by CFC will be the sedimentation pond at the refuse pile site. This pond is an incised pond with an embankment consisting of native materials. A slope-stability analysis was performed on this pond embankment material and is provided in RA Attachment 5-1. According to this analysis, the minimum safety factor for the sedimentation pond embankment is 1.9 under static moist conditions. Furthermore, the analysis presented in RA Attachment 5-1 indicates that a minimum safety factor of 2.2 will exist for the embankment under conditions of rapid drawdown. All analyses were performed assuming that the pond was full to its maximum design depth. These safety factors exceed the minimum requirements of R645-301-533.100.

533.200 Foundation Considerations

Soils investigations have been conducted at the site of the refuse pile area. Results of these investigations are presented in Chapter 2 and RA Attachment 5-1 of this submittal. During these investigations, foundation conditions in the area of the proposed sedimentation pond were evaluated. Based on these investigations, no conditions were encountered which suggested that the materials in which the pond would be constructed would be unstable. The slope-stability analyses presented in RA Attachment 5-1 indicate that the pond embankments will also be stable under operating conditions. Detailed cross sections of the sedimentation pond are presented on RA Plate 7-2 of this submittal.

533.300 Slope Protection

The inslopes of the sedimentation pond and portions of the outslope disturbed by the spillway construction were revegetated following construction to minimize surface erosion and protect the embankments against sudden drawdown. The interim seed mix was used for this revegetation effort (see Section 341.200 of this submittal).

Rapid drawdown in the sedimentation pond would be restricted to pumping the vertical distance between the spillway and the pond bottom, a distance of 11 feet (see RA Plate 7-2). Drawdown of this magnitude and rate is not considered significant and, therefore, not a stability or erosion concern. The analysis presented in RA Attachment 5-1 indicates that the slope of the embankment will be stable under conditions of rapid drawdown (minimum safety factor of 2.2). During pumping of the sedimentation pond, flow rates (and drawdown) will be controlled. Hence, it is unlikely that this drawdown will cause surface erosion of the embankment face.

533.400 Embankment Faces

Embankment inslopes and portions of the outslopes were revegetated following construction of the sedimentation pond, as outlined in Section 533.300. Riprap will also be placed on the upstream face of the embankment near the emergency spillway structure.

533.500 Highwalls

No highwalls will be located below the discharge lines of the sedimentation pond.

533.600 MSHA Criteria

The sedimentation pond does not meet the size criteria of 30 CFR 216(a).

533.700 Pond Operation and Maintenance Plans

The sedimentation pond has been designed as a total containment pond to contain the 100-year, 24-hour storm event, plus an adequate freeboard. Details of the design and the requirements for operation and maintenance of the pond are presented in Chapter 7 of this submittal.

534 Roads

534.100 Location, Design, Construction, Reconstruction, Use, Maintenance, and Reclamation

No permanent roads will be constructed in the storage area. The refuse will be transported to the refuse pile area using the existing county road. A temporary access road between the refuse pile area and county road will be constructed to allow equipment access to the pile. The temporary road will be reclaimed. The temporary road will be maintained in accordance with the approved M&RP. Refer to Section 527.200 for additional description of the transportation facilities.

Control of Damage to Public or Private Property. Roads will be designed in accordance with applicable county and State standards. By designing according to these standards, damage to public or private property will be been minimized.

Road Surfacing. The county road surface, which accesses the mine site, consists of asphalt. The temporary access road surface material will be surfaced with asphalt. No acid- or toxic-forming materials will be used in the road surfaces. The characteristics of the substances used for road

surfaces will be nonacid-and nontoxic-forming. The roads are not established on constructed lands and road slopes are less than 2:1.

534.200 Environmental Protection and Safety

The design and construction of the temporary road will be in accordance with Section 534.200 of the approved M&RP.

534.300 Primary Roads

The access road to the refuse pile will be constructed in accordance with the requirements of Section 534.300 of the M&RP.

535 Spoil

No spoil will be generated in the refuse pile permit area.

536 Coal Mine Waste

Coal mine and underground development waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at the refuse pile.

536.100 Design

The designs and their associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the site of the refuse pile. These results are presented in RA

RA ATTACHMENT 5-6

REFUSE PILE ACCESS ROAD DRAWINGS